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ABSTRACT

The comparative effectiveness of different types of instructors' notes provided during lectures of varying complexity was examined. Ninety-four undergraduates (sophomores and juniors) at a large Midwestern university were presented with 2 taped lectures, each about 60 minutes long. The first lecture was a fact-based description of instructional formats, and the second lecture discussed theories of motivation. Before each lecture, the subjects received either complete or skeletal notes concerning the lecture. After each lecture, students reviewed their notes and then completed a 10-point examination, which assessed application, analysis, and knowledge of instruction objectives. Subjects also completed a brief rating scale assessing the usefulness of the notes provided to them. The best performance on the posttest occurred after the more information-based lecture, with performance on the knowledge portion of the posttest also significantly better. The type of notes appeared to have little effect. No long-term recall was measured. Lecture complexity appeared to be a variable that might be more carefully considered in future research on instructor-provided notes. One table summarizes posttest results. (Author/SLD)

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Instructor-Supplied Notes and Higher-Order Thinking

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Abstract

The comparative effectiveness of different types of instructors' notes provided during lectures of varying complexity was examined in this study. Ninety-four college students received either complete or skeletal notes over either a more abstract or more informative educational psychology lecture. Application and analysis instruction objectives were assessed, as well as knowledge on an immediate posttest. Results indicated that the best performance occurred after the more information-based lecture, with recall of facts also significant. No long term recall was measured. Lecture complexity appears to be a variable that must be more carefully considered in future research on instructor-provided notes.

Summary

Teachers know well that good lecture presentations frequently involve a wide variety of content of varying difficulty. Included in a typical lecture might be a number of basic definitions, factual statements, broader concepts and the relation between concepts, as well as examples. Several different kinds of thinking might be required by the listening students as the lecture progresses. Indeed, the subject matter being presented may vary in difficulty as well as complexity as lecture content moves from informative, factual information to abstract, theoretical concepts.

It is often assumed that note-taking automatically serves an encoding function, in which learners are spontaneously engaging in a deeper cognitive processing of lecture materials than do non-note-taking listeners. Examinations of notes however often reveal a simple paraphrased listing of information rather than a more conceptual gathering of main ideas, or an integration of old and new knowledge (Bretzing & Kulhavy, 1981; Kiewra & Fletcher, 1984). It seems reasonable to hypothesize that the effectiveness of the notes students use is influenced by how closely the notes correspond to the complexity and demands on thinking presented by the lecture itself.

Several researchers have experimented with notes supplied by the instructor. A summary of studies by Kiewra (1985) indicates that reviewing of instructors' notes prior to a delayed exam leads to

higher achievement than do personal notes, but for tests taken immediately after the lecture, instructors' notes are actually interfering. Reviewing both personal notes and instructors' notes produced the highest level of achievement. Thus the accuracy of the instructors' notes and the cues associated with personal notes combine to have the most beneficial effect. Of interest is the finding that in no study was there a difference in performance due to type of notes reviewed on more cognitively complex learning outcomes such as application or analysis. This was probably due to the informational nature of most instructors' notes, which present the main points in an organized outline, but do not reformulate nor integrate the main ideas. Maximizing higher order learning may depend upon providing learners with specific instructions to process the lecture at higher levels of abstraction, as well as providing higher order thinking cues in the notes themselves.

Another approach to aiding students' notetaking is to provide skeletal notes, in which the lecturer's main ideas are presented in an organized form, but some details are omitted and blank spaces are left to indicate their omission. They are designed to serve as an advance organizer (Ausubel, 1968) permitting learners to perceive the structure and content of the lecture as it progresses. Skeletal notes have been found to produce more recall than personal notes only or instructor's full notes used alone (Hartley, 1976). Their effectiveness is associated with the increased encoding required by listeners as they strive to complete the missing details (Kiewra, 1988).

The form and difficulty level of the criterion task used to determine achievement is also critical to research on note taking. Criterion measures that assess performance outcomes consistent with instructor objectives have not always been utilized in past research attempts. Careful construction of examinations controlled for difficulty level, that assess a specific type of instructional outcome, and that can be matched to corresponding content in the lecture, will provide a clearer picture of the effects of various note taking formats.

Research has not been adequately designed to take into account the probable interactions between the cognitive complexity or difficulty of the lecture presented, the type or completeness of notes that students use and the form and difficulty level of the criterion test used to evaluate student performance. This study was an attempt to examine these critical interactions.

Methodology

Subjects

Ninety-four undergraduate students enrolled in introductory educational psychology sections composed the sample of this study. Subjects were sophomores or juniors admitted to the School of Education of a large, midwestern university.

Procedure and Materials

Subjects were presented two taped lectures of approximately 60 minutes duration on successive class days. The first was a fact-based description of instructional formats used by teachers--the lecture, the recitation and the discussion, including research evidence on the effectiveness of each. The second discussed theories of motivation, with particular emphasis on attribution theory. Both topics had not been covered earlier in students' course work. Subjects were provided either a full set of notes prepared by the lecturer, or a skeletal set in which random items were deleted, with spaces left indicating the omission. Type of notes provided to students were reversed on the second lecture.

After each lecture, students were allotted five minutes to independently review their notes. A ten point exam consisting of five knowledge or recall questions and five application or analysis questions was then administered. Items used had been previously analyzed in similar educational psychology classes and ranged in difficulty from .50 to .80. Subjects were allowed ten minutes to complete the exam. A brief rating scale assessing the usefulness of the notes provided for that particular lecture was completed as a final task.

Results and Discussion

Summary statistics are presented in Table 1. Analysis of variance of total post-lecture scores revealed only type of lecture to be significant, $F(1,184) = 58.12$, $P < .001$. As can be observed in Table 1, total performance was much better following the lecture on instructional formats, regardless of note condition. This difference was primarily attributable to superior performance on the knowledge sub-tests, $F(1,184) = 214.33$, $P<.001$.

Insert Table 1 Here

Apparently, a difference in the difficulty level of the two content areas was the critical variable in this study. Subjects were more able to recall information provided in the lecture that was less theoretical, with type of notes provided having little effect. The lectures covered novel material and test difficulty was controlled so effects of previous learning and of measurement bias must be discounted. Subjects' written evaluation of notes provided for the motivation lecture indicated some dissatisfaction with their usefulness, when compared to the instruction notes. This finding supports the view that the motivation content was more difficult to encode. It would seem that lecture complexity is a variable that must be more carefully considered in future research on instructor-provided notes.

Both complete and skeletal notes failed to differentially effect type of thinking required on immediate posttest performance. Because of the within-course nature of this experiment and the difficulty involved in limiting subjects future study of only one set of notes, it was not possible to validly examine long-term recall. This comparison seems necessary for future research of this type, based on Kierwa's (1985) finding of improved achievement with instructor's notes on delayed recall.

Table 1
Means and Standard Deviations of Immediate Posttests for Lecture and Note Conditions

		Full Notes			Skeletal Notes		
Type of Lecture		N	M	SD	N	M	SD
Instruction	Total	42	7.40	.96	52	7.13	1.25
	Knowledge	42	4.36	.62	52	4.29	.67
	Application	42	3.04	.91	52	2.84	1.11
Motivation	Total	52	5.58	1.5	42	5.83	1.70
	Knowledge	52	2.46	.94	42	2.66	.99
	Application	52	3.123	1.08	42	3.17	1.18